

PUBLIC HEALTH LABORATORY NOTES

Abstracted by ARTHUR LEDERER, M. D.

A New Reaction for Urea and Its Clinical Value.—The authors describe a new reaction for urea. The addition of Ehrlich's aldehyde to the urine produces a greenish-yellow coloration. A marked greenish-yellow coloration is also produced when Ehrlich's aldehyde is added to a watery solution of urea. No other substance occurring in normal urine, except urea, produces this reaction. The authors think the reaction will be of great practical value in estimating the residual nitrogen in blood serum, which has hitherto been a complicated procedure. In carrying out the test, the albumin of the serum is removed by means of 20 per cent trichloroacetic acid; to one c.c. of the filtrate two drops of Ehrlich's formaldehyde are added. A yellowish-green color is only produced when the residual nitrogen is pathological in amount. A positive reaction indicates an increase of the residual nitrogen. The authors think this reaction will be of value in clinical work, as a rough means of deciding if the residual nitrogen is normal or pathological in amount. Only a small quantity of blood serum is required for the test.—Weltmann and Barrenscheen, *Klin. Woch. sch.*, May 27, 1922; *Brit. Med. Jour.*, July 1, 1922.



Serological Test for Cancer.—The authors claim to have devised a serological test for cancer based upon the reducing power of the serum. The ingredients necessary for the test are, (a) an extract of malignant tumor prepared by maceration of the tissues in one per cent sulphuric acid and a mixture of alcohol and ether, the two solutions after evaporation being redissolved in water, neutralized and sterilized; (b) a 1 in 300 solution of methylene blue containing 1 c.c. of glycerine; (c) normal serum and serum to be tested. On mixing graded quantities of normal serum with the extract and one drop of the methylene blue solution, reduction of the methylene blue gradually takes place, beginning at the bottom of the tube. This reduction does not take place for at least 60 minutes when normal serum and extract are mixed with methylene blue, but if the serum comes from a case of cancer the

reduction often commences within ten minutes and is complete much earlier. In sixty-three patients not suffering from malignant disease negative results were found, while eighty cases of cancer affecting different organs all gave a positive result. In an advanced case of inoperable cancer the blood reaction was negative, a result which the authors ascribe to a failure of the defensive ferments due to the advanced stage of the disease. Again it would appear that an individual whose parents have suffered from cancer may show a positive reaction although not suffering from a tumor at the time, this being an indication of a predisposition to malignant disease. Cases are recorded in which the reaction was positive before the removal of the tumor and negative afterwards.—Thomas and Binetti, *Les Néoplasmes*, March, 1922; *Brit. Med. Jour.*, July 8, 1922.



Complement Fixation in Typhoid Fever.—In the course of typhoid infection, the formation of complement-fixing anti-bodies is one of the earliest and most constant immune manifestations. The introduction of a differential quantitative, active serum technique for the complement fixation test makes it possible to utilize this property for the diagnosis of typhoid fever with satisfactory results. In a limited number of typhoid cases the test has been repeated with inactive serum and found similarly satisfactory. It is recommended, however, that the active serum technique be used, as it saves much time in the routine work of the test.—L. G. Hadjopoulos, *Jour. Inf. Dis.*, 31, 226 (1922).



The Hecht-Weinberg-Gradwohl Test.—A total of 150 serums were examined. The reactions with the Hecht-Weinberg-Gradwohl test were hardly so marked as with the Wassermann technique, but the Gradwohl modification might be considered somewhat superior when relying only on the results with the acetone-insoluble antigen in each method. On the other hand, the use of the cholesterinized antigen with the Wassermann method showed a stronger reaction with each positive serum

(with one exception), and further gave a stronger positive reaction in one case (tertiary syphilis) which was negative with the Hecht-Weinberg-Gradwohl technique. In this work all serums giving positive reactions came from patients who gave a clear clinical history of syphilis with the exception of one who had a suspicious history.—L. W. Famulener and Julia A. W. Hewitt, *Jour. Inf. Dis.*, 31, 285 (1922).



Colorimetric Determination of Hemoglobin with the Aid of Stable Standards.—Methods are offered for preparing: (a) A concentrated stock solution of acid hematin to be kept in ampules; (b) a stable dry acid hematin protein powder of uniform color, from which standards may be prepared by weight; (c) transparent acid hematin gelatin films which may be substituted for Newcomer's glass plate. The factor of turbidity invariably present in acid hematin solutions as usually prepared from whole blood is discussed, and suggestions are offered for its elimination. The employment of heat for the more rapid development of maximum color has been found objectionable. Method suitable for routine hemoglobin determinations is proposed.—Edwin H. Terrill, *Jour. Biol. Chem.*, 53, 179 (1922).



Studies on Cerebrospinal Fluid and Blood of Syphilitic and Normal Persons.—The globulin fraction in syphilitic serum contains the active substance in the Wassermann reaction. The filtrability of globulin in syphilitic serum by the ultra-filter was less than that in the normal serum. Positive colloidal gold reactions are due to the presence of precipitating substances. Both precipitating and protecting substances are present in pathologic cerebrospinal fluid. Albumin and globulin may possess both precipitating and protecting power. Ultra-filtrates of syphilitic and non-syphilitic serums give curves that are more or less similar, but there tends to be a greater difference between the zones of reduction of the original and filtered serum in syphilitic than in normal cases. The protecting substance is decreased by ultra-filtration to a greater degree than the precipitating substance. The salt solution used in the colloidal gold test partially neutralizes the protective action.—Charles E. Nixon and Koichi Naito, *Arch. Int. Med.*, 30, 183 (1922).

Value of Basal Metabolism Determination in Hyperthyroidism.—As deviations from the normal in basal metabolic rates are not always dependent on diseases of the thyroid, the author urges that a very careful history and painstaking examination should always precede the basal metabolism determination. This clinical study, if sufficiently thorough, will suffice to make the diagnosis in many cases. There are borderline cases, however, in which the metabolic rate will prove very helpful. In conjunction with the usual clinical signs of toxicity the basal metabolic rate assists materially in deciding what form of therapy is more advisable. As changes in the metabolic rate frequently precede changes in the clinical picture, metabolism estimations at stated periods afford a valuable means of checking any therapeutic measure, either medical or surgical.—H. F. Stoll, *Boston Med. Surg. Jour.* 187, 127 (1922); *Jour. A. M. A.* 79, 765 (1922).



An Injection Method for the Identification of Tapeworm Species.—A simple method for visualizing the uterus in tapeworm proglottides, to identify the species, or for demonstration purposes, as used in the wards and laboratories of the Cincinnati General Hospital for the past five years, consists in the injection of the canals with India ink. A hypodermic syringe (1-2 c.c.), fitted with a fine needle, is filled with India ink. The segment to be injected is held flat on a piece of glass by means of a wooden match stick or applicator, and the needle inserted into the substance of the fresh proglottis, near the lateral genital pore. With a little manipulation, one of the diverticulae of the uterus is easily entered and the ink readily fills all the branches. Pressure between two glass slides brings out the details very clearly, and the sparsely branched organ of *T. solium* is easily differentiated from the more abundant ramifications of *T. saginata*. The method is also applicable to other cestodes, and may also be used with preserved material, although the results are not as complete as with fresh. Permanent preparations may be made by preserving the flattened segment in 10 per cent formaldehyde, dehydrating in alcohol, and after clearing the xylol or carbol-xylol, mounting in balsam.—Raphael Isaacs, *Jour. Lab. Clin. Med.* 7, 689 (1922).

Influence of Certain Carbohydrates on Sugar Content of Blood.—The author charts the repeated findings in six diabetics and in six normal subjects. They show that the rise in the sugar content of the blood reached the highest point in about an hour in both groups, but it was far more pronounced in the diabetic. The hyperglycemia was lowest after ingestion of oatmeal and much higher with rice. In one diabetic, for example, after ingestion of 75 gm. of glucose the blood sugar rose from 1.24 to 2.12 in one hour and by the third hour was 0.88. After ingestion of oatmeal the corresponding figures were 1.8, 1.37, 0.90 and 1. With rice they were 1.04, 1.60 and 0.98. The physiologic sugar content of the blood averaged in the six normal subjects 0.5 to 1 gm. per cent.—M. Casteigts, *Rev. Asoc. Med. Argentina*, 35, 28 (1922); *Jour. A. M. A.*, 79, 859 (1922).

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The Kahn Precipitation Test in the Diagnosis of Syphilis.—Recently, Kahn (*Arch. Dermat. Syph.*, 5, 570, 1922) has proposed for the serologic diagnosis of syphilis a precipitation reaction in which he utilizes, as antigens, alcoholic extracts of heart muscle, with and without the addition of cholesterol. The clinical application of this reaction, in 350 unselected cases entering the service of dermatology and syphilology of the University Hospital, Ann Arbor, forms the basis of this study. The clinical application of the Kahn precipitation test compares favorably in sensitiveness with the standard Wassermann reaction. It has obvious great advantages over the Wassermann reaction in: (1) simplicity of procedure, (2) rapidity of reading, and (3) reduction of the sources of error through elimination of a hemolytic system. Its obvious advantages over other precipitation reactions lie in the visibility of the precipitate to the naked eye, and the frequent spontaneous reactions with strongly positive serums. Further confirmatory tests, demonstrating parallelism with the Wassermann reaction, may well lead to the eventual abandonment of the latter in favor of the simpler precipitation procedure. As a last advantage, a test embodying only one reagent plus a serum offers a greater possibility of standardization.—Harther L. Keim and Udo J. Wile, *Jour. A. M. A.*, 79, 870 (1922).

Serodiagnosis of Syphilis by Flocculation.

—The author describes the technic of his flocculation test for syphilis and gives comparative results in 1,500 cases. Leaving the weakly positive differences out of account, there was complete agreement between the results of the Wassermann and the Bruck tests in 98.6 per cent of the cases. As some of the advantages of his test over other flocculation test, he states that: (1) It is carried out with the same, constant extract suspension, without special additions, so that the results are not affected by the accidents arising from the necessity of preparing new dilutions. (2) An incubation cabinet and special optical methods (agglutinoscope) are superfluous. (3) As there is no necessity of long incubation or keeping the serums at room temperature, the danger of non-specific flocculations is avoided. (4) The technic is exceedingly simple and the reaction is prompt. The results are brought out sharply and—aside from the time required for inactivation—the result is obtained in less than half an hour.—C. Bruck, *Deutsche Med. Woch. Schr.*, 48, 825 (1922); *Jour. A. M. A.*, 79, 924 (1922).

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The Sugar Content of the Blood After Dextrose Enemas.

—The authors injected into the rectum 100 or 200 gm. of a strong solution of dextrose, giving it by rectal drip in the lower part of the ampulla. They tested the sugar content of the blood and urine every hour. In their seventeen tests the sugar content of the blood kept within normal range, but in seven cases there was decided glycosuria for up to seven hours. In one case it totaled 4.6 gm. This is in marked contrast, they say, to the findings when dextrose is given by the mouth; the blood sugar runs up then by 100 per cent or more, while there is no glycosuria. They ascribe this to the fact that the dextrose, as they gave it by the rectum, was absorbed directly into the blood without passing through the liver. It thus acted like a foreign substance and was cast off by the kidneys. When it passes through the liver it becomes modified in some way that adapts it as part of the organism, and when it reaches the kidneys, these organs do not cast it off. This assumption credits a new function to the liver, the transformation of dextrose in this way.—Varela and Rubino, *Med. Klinik, Berlin*, 18, 831 (1922); *Jour. A. M. A.*, 79, 924 (1922).

Diagnostic Value of Glucose Tolerance.—

The sugar analyses of blood and urine made by the author in a series of varied cases show graduation of assimilation which may be designated as, (1) strong normal, (2) normal, (3) weak normal or prediabetic, (4) diabetic. With all possible allowances for uncertainties presented by renal glycosuria, toxic or infectious states, or other endocrine disorders, the simple glucose test revealed many cases of early or latent diabetes, in which prophylactic dietary regulation is a rational procedure. Studies of the largest possible numbers of such cases over the longest possible period of time will be necessary to establish their progress with certainty, but it seems probable that many cases of diabetes may be prevented by diet instituted on the basis of glucose tolerance tests in the prediabetic stage.—H. J. John, *Jour. Metab. Res.*, 1, 497 (1922); *Jour. A. M. A.*, 79, 682 (1922).



Value of Weil-Felix Reaction in Typhus.

—The author has found the Weil-Felix reaction of considerable value as an aid in the diagnosis of typhus. Only agglutinations in dilution of 1:50 and upward should be accepted as definitely diagnostic typhus. Agglutinations in lower dilutions may be suggestive if in keeping with the clinical features, and call for a further test in a few days' time. The test may be positive on the fifth day, but is usually not so until the second week. The strongest reactions may be expected about the twelfth or fourteenth day. A positive reaction may persist for a few weeks, or at most a few months, after recovery. Typical cases may never develop a positive reaction, so that no stress should be laid on a negative reaction if the clinical features justify the diagnosis.—J. H. H. Pirie, *Med. Jour. South Africa*, 17, 197 (1922); *Jour. A. M. A.*, 79, 686 (1922).



Spirochaeta Pallida in Sperm.—

In 1920 the author began to study the possibility of the transmission of spirochetes by the germ, and a little later Pinard and Hoch reported having found *Spirochaeta pallida* in 3 of 11 specimens of human sperm. His further research confirmed theirs. Besides his microscopic research, he inoculated the anterior chamber of the rabbit eye with human sperm, obtained by massaging the seminal vesicles after injecting

200 c.c. of physiologic saline into the bladder. *Spirochaeta pallida* was found in 5 of 22 specimens examined. In one case the spirochete was attached to the tip of the spermatozoon head by one end and to the middle piece by the other end. In another case, half the spirochete clung to the middle of the tail, the other half floating free. Of the 22 inoculation experiments, a positive result was obtained in 9 and negative results in 10. The spirochete was refound in only 2 instances. There was supuration in 3 of the rabbit eyes. Carle states that the mother giving birth to a syphilitic child is always syphilitic, although seemingly in perfect health. It often happens, however, that these women reexamined in the course of several years will not present any signs of syphilis, and that the seroreaction will remain negative.—R. Lakaye, *Arch. Med. Belges*, 75, 385 (1922); *Jour. A. M. A.*, 79, 686 (1922).



Gonococci in Gonorrheal Eruption.—

The authors report what they think is the first case of a petechial eruption in the course of gonorrhea, with gonococci in the blood, in which the gonococcus was found in the depths of the skin. The microscope differentiated it from the meningococcus.—Paschen and Jentz, *Med. Klinik, Berlin*, 18, 428 (1922); *Jour. A. M. A.*, 79, 690 (1922).



The Use of Desiccated Blood Serum in the Typing of Blood.—

The laboratory worker has been confronted with a problem in preserving the necessary serum with which to perform these tests. Fluid serum is ordinarily used for performing the test and is usually preserved by the addition of some substance such as phenol or glycerin, or a combination of the two. Sanford has devised a method, a modification of the Moss test, in which he uses serum dried on ordinary cover glasses for the purpose. This method necessitates the employment of numerous cover glasses and involves a considerable expenditure of time and energy, especially if a considerable number are prepared. The author has found that an equally advantageous measure has been to dry the blood serum and store it in hermetically sealed containers and place a small amount of it in solution with normal saline when needed for a test. In this manner he avoids the use of serum to which more or less objectionable preservatives have been added

and eliminates the features of cloudiness, precipitation and unsightliness which are evident in serum which has been preserved by the addition of chemicals.—William G. Gill, *Milit. Surg.*, September, 1922.



Sugar Tolerance in Dementia Praecox.—

Except in cases of active catatonia, certain cases of simple deteriorating dementia praecox and several cases in which evident emotional upsets existed at the time of the test, the author's investigation points to a blood sugar concentration in mental disease that is practically normal when the test is made while the patient is fasting, the average being 0.105 per cent. The response of patients with mental disease to sugar feeding is generally within normal range. Patients in the active stages of catatonic dementia praecox responded to glucose feeding with a hyperglycemia that resembles the response obtained in hyperthyroidism. Several patients with simple deteriorating dementia praecox responded to glucose feeding in a manner that resembles the responses obtained in certain endocrine disturbances, such as dyspituitarism. Patients suffering from manic depressive insanity—depressed phase—responded to the sugar test with a curve higher than that found in normal subjects.—W. F. Lorenz, *Arch. Neur. Psych.*, 8, 184 (1922); *Jour. A. M. A.*, 79, 994 (1922).



Colloid Reactions of the Cerebrospinal Fluid.—The author reiterates that the colloidal benzoin test is instructive in various forms of neurosyphilis. In general paresis the benzoin reaction is very pronounced, as also often in tabes. In clinically progressing forms of cerebrospinal syphilis, the colloidal benzoin reaction is positive. When progressing syphilitic lesions have disappeared and only sequelae remain, such as hemiplegia, paralysis, etc., the colloidal benzoin reaction is often negative. In secondary syphilis, the benzoin reaction is positive only in patients having pronounced hyperalbuminosis and hypercystosis, with positive Wassermann reaction. The reaction is negative in patients with lesions of the nervous system of non-syphilitic origin. It is always negative in epidemic encephalitis while the Wassermann reaction may be positive. Comparing the Wassermann reaction and the colloidal benzoin reaction in neurosyphilis, one may be positive while the other is negative, and vice versa. Cases exist in which a positive colloidal benzoin reaction

alone leads toward a diagnosis of neurosyphilis, confirmed later by the evolution of the disease, and the Wassermann test becoming positive after reactivation with arsenical or mercurial treatment. It is also of real prognostic value, and can give important data on the gravity of clinical cases. It is simple and accurate and should be used in conjunction with the Wassermann reaction, and will give valuable information on the acute and subacute evolution of syphilitic lesions. The author describes his technic in detail, and extols the advantages of this colloidal benzoin method over the Lange, Emanuel and other tests.—G. Laroche, *Bull. Méd., Paris*, 36, 530 (1922); *Jour. A. M. A.*, 79, 1001 (1922).



Complement Fixation in Gonorrhea.—

The author reports the results of a series of 1,000 tests tried in the venereal disease department of St. Thomas' Hospital. The most striking points which he has found are: (1) The early stage at which a positive result may be obtained. (2) The relatively high percentage of positives in undoubted cases of active gonorrhea (average 86.5 per cent). (3) The very low incidence of "false positives"—only 3 in 1,000. In none of these latter cases could gonorrhea be absolutely excluded, and the cases were only included because the medical officers in charge of the cases marked them "non-venereal."—T. E. Osmond, *Lancet*, June 10, 1922, 1143 (*D. G.*).



The Bacteriology of Dental Caries.—

The research reported is from the Bland-Sutton Institute of Pathology, Middlesex Hospital, London. In the examination of selected carious material the constant presence of a definite type of bacilli was noted. These bacilli are capable of forming a high degree of acidity by the fermentation of carbohydrates. Teeth left in contact with cultures over prolonged periods showed changes almost identical with natural caries; namely, erosion of the enamel, penetration of the dentinal tubules, and the formation of liquefaction foci. These bacilli in their resistance to and formation of acid resemble the acidophilus group of Moro; biologically, however, there are several points of difference. To these bacilli the authors give the name *B. acidophilus odontolyticus*, Types I and II.—J. McIntosh, W. W. James and P. Lazarus-Barlow, *Lancet*, June 17, 1922, 1183 (*D. G.*).

Value of Complement Fixation in Pulmonary Tuberculosis.—The authors have previously shown that a positive complement fixation test is obtained in 98 per cent of cases with tubercle bacilli in the sputum. They have subsequently collected evidence which suggests that this small error of 2 per cent occurs in cases of very sudden onset and running a very rapid course, in which presumably the tubercle bacilli are so virulent and the invasion so massive that those cells of the body which are responsible for the production of the complement fixing substances are overwhelmed with toxins and unable to respond to the call made on them. In the rare cases in which with symptoms due to tuberculosis, the test is negative at first but later becomes positive, it is reasonable to assume that a sufficiently long interval has not elapsed from the time of infection for the complement fixing substances to be developed. In a series of controls consisting of healthy persons or persons suffering from diseases other than tuberculosis the test was negative in 98.5 per cent. In a series of 50 cases with symptoms strongly resembling those of pulmonary tuberculosis, and sometimes even with apical signs, giving a negative result to the test, 49 showed no further evidence of tuberculosis infection from 10 to 20 months later.—A. L. Punch and A. H. Gosse, *Brit. Med. Jour.*, July 15, 1922, 79 (D. G.).



Pneumococcus Antibody in the Treatment of Pneumonia.—The authors report the results of studies made in over 900 cases of lobar pneumonia at Bellevue Hospital for the past two years. In the series in which there were 917 cases, bacteriological examination showed that 90 per cent were of pneumococcus origin. The greater part of the remainder were referable to Streptococcus hemolyticus or Streptococcus viridans. In the pneumococcus series, Type I predominated (38.4 per cent). Type IV was next with 27.7 per cent; Type II (18 per cent), and Type III (15.9 per cent). In 424 cases of pneumococcus treated with pneumococcus antibody solution (preparation of which is described) the death-rate was 21.4 per cent. A control series of 410 cases in the same institution showed a death-

rate of 28.3 per cent. Pneumococcus antibody produced its most striking effect in pneumococcus Type I pneumonia—in a series of 156 treated cases the death-rate was 13.3 per cent; while a control series of 162 cases showed a death-rate of 22.2 per cent. A definite but less marked effect was observed in cases of pneumococcus Types II and IV pneumonia which were treated with antibody. The antibody solution had no effect whatever on the death-rate in pneumococcus Type III pneumonia. The death-rate of Streptococcus pneumonia was not favorably influenced by antibody treatment. In the series of patients treated with antibody 28.8 per cent recovered on or before the fifth day. In the control series only 7.9 per cent recovered on or before the fifth day.—R. L. Cecil and N. P. Larsen, *Jour. Amer. Med. Assn.*, July 29, 1922, 343 (D. G.).



CONVENTIONS, CONFERENCES AND MEETINGS

This calendar is published through the co-operation of the National Health Council, 370 Seventh Avenue, New York City. The Council will be glad to answer promptly any written or telegraphic inquiries regarding meeting dates in order to avoid conflicts.

October 23-27, American College of Surgeons.

November 1-4, National Association Practical Refrigerating Engineers, St. Louis, Mo.

November 13-16, Southern Medical Association, Chattanooga, Tenn.

November 14-16, New York State Conference of Charities and Corrections, Albany, N. Y.

December 1-2, Forty-eighth Session New Jersey Sanitary Association, Lakewood, N. J.

December 8-9, Western Surgical Association, Minneapolis.

December 12-14, Southern Surgical Association, Pinehurst, N. C.

December 26-30, American Association for Advancement of Science, Boston, Mass.

FOREIGN MEETINGS

December 18-23, International Congress on Health Education, Paris.